DOCUMENT RESUME

ED 113 686 CS 002 189

AUTHOR Sakamoto, Takahiko
TITLE Translations of Reading Research Articles Appearing in Japanese Journals.
PUB DATE 74
NOTE 28p.; Unpublished study; Not available in hard copy due to marginal legibility of original document

EDRS PRICE MF-$0.76 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS Elementary Secondary Education; *Japanese; Languages; Periodicals; *Readability; Reading Ability; *Reading Development; *Reading Research; *Reading Speed
IDENTIFIERS *Japan

ABSTRACT

"A Psychological Study of Flexibility in Reading," the first in this collection of four articles, attempted to determine how flexibility in reading develops from elementary to junior high school. The results indicated that children in every grade in this experiment were flexible in reading, that is, they changed their speed of reading according to the reading materials. The "Developmental Study on the Difficulty Factors in Reading Kanji" concluded that the complexity of characters had no effect on the reading of Kanji, the frequency of Kanji was one of the significant factors which affected reading, and the familiarity of words in which Kanji characters were used was the most predominant factor in reading. The purpose of the third article, "A Yardstick for Readability," was to develop an objective method to assess the readability of Japanese sentences. "A Developmental Study of Reading Rate" determined that the speed of reading, given appropriate materials, was not the same for grades 2-9 and that there was a consistent increase in the rates of reading from grades 3-5. Furthermore, the accuracy of reading differed between schools. (LL)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED113686

TRANSLATIONS OF READING RESEARCH ARTICLES APPEARING IN JAPANESE JOURNALS

Takahiko Sakamoto
The Noma Institute of Educational Research
Tokyo, Japan
Visiting Scholar - Hofstra University
Summer, 1974

CS 002 189

BEST AVAILABLE COPY

A Psychological Study of Flexibility in Reading

Akira Okada

PART I

Problem

How does flexibility in reading develop from elementary to junior high school?

Methods

(1) Subjects were third, fifth, and seventh graders. (Number of Ss not described.)

(2) A narrative story and an expository story were selected from the textbooks of the second graders and used as reading materials for all subjects.

(3) The instruction to the subjects was: "I would like you to read as fast as possible. After reading, I want you to answer comprehension questions. When you hear the bell during reading, circle the letter which you are reading at that moment."

(4) The bell was rung every 30 seconds. The subjects practiced circling the letter at the moment of the bell before the main experiment for about 20 minutes.

(5) The reading time was shown by the experimenter using cards at an interval of ten seconds. After reading, the subjects looked at the card and wrote down their own reading time.

Science of Reading, Vol. 11, No. 1-2, pp. 16-21, 1968.
(Japan)

Findings

Table 1

Gross Rate and Effective Rate in the Narrative Story

Subjects	Gross Rate	% of Comprehension	Effective Rate	% Who Read Story Before
M, 3rd grade boys	416.3	87.7	369.5	15
S.D.	46.3	5.9	36.3	
M, 3rd grade girls	391.9	93.3	365.5	20
S.D.	36.3	4.3	26.4	
Total M	404.1	90.5	367.5	17.5
S.D.	41.3	5.1	31.4	
M, 5th grade boys	538.0	97.2	521.1	0
S.D.	48.5	2.3	25.3	
M, 5th grade girls	575.5	95.3	541.7	9
S.D.	47.8	2.2	26.3	
Total M	556.8	96.3	531.4	4.5
S.D.	48.4	2.3	25.8	
M, 7th grade boys	487.6	90.0	458.1	9
S.D.	47.3	1.9	25.3	
M, 7th grade girls	580.3	97.1	564.9	5
S.D.	46.9	1.3	27.3	
Total M	534.0	93.6	511.5	7
S.D.	47.1	1.6	26.3	

G.R. = letters read per minute

E.R. = G.R. x % of comprehension

Gross Rate and Effective Rate in the Expository Story

	G. R.	% of Comprehension	E. R.	% who read story before	Difference between Narrative and Expository Stories: G. R.	% of Comprehension	E. R.
M, 3rd grade boys	309.5	61.8	182.1	6.7			
S.D.	45.7	11.3	30.3				
M, 3rd grade girls	343.6	66.1	228.5	5.0			
S.D.	46.3	11.2	33.1				
Total M	316.6	64.0	205.3	5.9	+87.5	+26.5	+162.2
S.D.	46.0	11.3	31.6		**		**
M, 5th grade boys	480.7	58.1	291.3	0.0			
S.D.	47.7	13.6	35.2				**
M, 5th grade girls	505.6	64.2	326.0	5.0			
S.D.	45.9	11.3	28.3				
Total M	493.2	61.2	308.7	2.5	+63.6	+35.1	+222.
S.D.	46.8	12.5	31.8		**		**
M, 7th grade boys	437.1	67.2	287.6	0.0			
S.D.	46.8	12.7	36.3		*		
M, 7th grade girls	439.2	64.3	287.4	0.0			
S.D.	45.7	11.8	33.4				
Total M	438.2	65.8	287.5	0.0	+95.8	+27.8	+224.
S.D.	46.3	12.5	34.9		**		**

* significant at 5% level

** significant at 1% level

Table 3

Flexibility in Reading within the Narrative Story
(distribution of the number of letters read per 30 seconds)

	BOYS		GIRLS		TOTAL	
	S.D.	$\frac{S.D.}{M} \times 100$	S.D.	$\frac{S.D.}{M} \times 100$	S.D.	$\frac{S.D.}{M.} \times 100$
3rd grade	39.7	19	31.6	16	35.7	18
5th grade	29.5	11	37.3	13	33.4	12
	*					
7th grade	43.4	19	32.1	12	37.8	16

* significant difference at 5% level

Conclusions

(1) Children in every grade in this experiment were flexible in reading, that is, they changed their speed of reading according to the reading materials (significant at 1% level)).

(2) Between the 3rd and the 5th grades, development of flexibility was observed in terms of the effective rate. The development of the gross rate was observed between the 5th and 7th grades.

(3) There was no development of flexibility during the reading of a story.

PART II

Problem

Does training in speed reading influence flexibility of reading in addition to speed of reading? Flexibility is defined as changes in speed according to the reading material.

Methods

(1) The subjects were junior college students (all girls), nine as an experimental group and four as a control group.

(2) Two literature-type texts and three essay-type texts were used as pre- and post-tests. The first half of each text was used as the pre-test and the latter half as the post-test.

(3) In the pre- and the post-tests, the subjects were asked to read the text as fast as possible. They were informed of the comprehension tests after reading.

(4) Four books were selected as the reading materials for the training of reading speed. The training took place five days a week, for four weeks.

In each session, the subjects of the experimental group were asked to read as fast as possible. The control group had no training. Before reading, the subjects were allowed to skim the material for 25 seconds. After reading, comprehension tests were conducted. The reading time as well as the comprehension scores were reported to the subjects.

Findings

Table 4

G.R. and E.R. in Pre-test

		Text A	Text B	Text C	Text D	Text E	M	S.D.	$\frac{S.D.}{M} \times 100$
Experimental Group	G.R.	690	708	768	708	624	700	44.7	6.4
	E.R.	669	683	598	585	485	605	53.6	8.8
Control Group	G.R.	714	726	576	726	636	676	60.3	8.9
	E.R.	698	706	475	627	530	607	85.7	14.1

G.R. and E.R. in Post-test

		Text A	Text B	Text C	Text D	Text E	M	S.D.	$\frac{S.D.}{M} \times 100$
Experimental Group	G.R.	971	963	970	912	912	946	26.1	2.7
	E.R.	860	802	768	793	802	805	29.1	3.6
Control Group	G.R.	816	779	699	689	614	715	70.6	9.8
	E.R.	733	630	470	589	525	589	86.9	14.7

Conclusions

(1) In the pre-test, there were no significant differences between the experimental group and the control group in terms of G.R. and E.R. In the post-test, there was a significant difference between the two groups at the .01% level in G.R. and at the 1% level in E.R. The training was effective in terms of the speed of reading.

(2) There were no significant differences which indicated improvement of flexibility of the experimental group.

BIBLIOGRAPHY

(1) Braam, L. Developing and Measuring Flexibility in Reading. Reading Teacher, 16, 1963, 247-251.

(2) DeLeeuw, M. and E. Read Better, Read Faster: A New Approach to Efficient Reading. Penguin Books, 1965.

(3) McClusky, H.Y. An Experiment on the Influence of Preliminary Skimming on Reading. J. Educational Psychology.

Developmental Study on the Difficulty Factors in Reading Kanji

Shusuke Fukuzawa

Purpose

To examine the difficulty factors in reading Kanji.

Methods

1. Eight conditions were set up according to the complexity (in shape) of Kanji, the frequency of usage, and the familiarity of words in which the Kanji appears (Table 1). The complexity (in shape) of Kanji was determined by the number of strokes. The frequency was determined by whether or not the Kanji was included in the list of Kyioku Kanji which was required to be taught by the end of the elementary school curriculum. The familiarity of words was determined according to The Basic Vocabulary for Education by L Sakamoto.
2. Ten words for each condition were selected. Each word consisted of one Kanji character plus some Hiragana letters.

Table 1

Condition	Number of Strokes	Frequency	Word
A	8 or less	Small (S)	Familiar (F)
B	8 or less	Large (L)*	F
C	8 or less	S	Unfamiliar (U)
D	8 or less	L	U
E	9 or more	S	F
F	9 or more	L	F
G	9 or more	S	U
H	9 or more	L	U

*"Large" indicates that Kanji characters are listed in Kyoiku Kanji which are required to be taught at elementary schools.

Science of Reading, Vol. II, No. 3, pp. 16-21, 1968 (Japan)

3. In conditions A and C, the same Kanji characters were used. They were presented as a part of familiar words in condition A, but as a part of unfamiliar words in condition C. Similarly, the same Kanji characters were used in conditions B and D, E and G, and F and H.
4. The subjects were 136 third graders (65 boys, 71 girls), 126 fifth graders (64 boys, 62 girls), and 134 seventh graders (71 boys, 63 girls) of Ashikaga City, Tochigi prefecture.
5. The subjects were asked to read the words in conditions B, C, E, and F and then ten days later to read the word in conditions A, D, F, and G, because the same Kanji characters appear in A and C, etc.

Findings

Mean and SD of Each Condition for Each Grade

Table 1

Conditions	3rd grade N-136		5th grade N=126		7th grade N=134	
	M	SD	M	SD	M	SD
A	2.34	1.13	4.76	2.11	6.17	1.97
B	9.25	1.21	9.44	0.79	9.60	0.10
C	1.06	0.82	3.39	2.10	5.18	2.06
D	7.17	1.92	7.98	1.56	8.72	1.40
E	0.88	1.12	4.07	2.45	6.46	2.88
F	9.32	1.07	9.52	0.76	9.63	0.82
G	0.38	0.89	3.22	2.19	5.69	2.79
H	7.81	1.88	8.50	1.35	8.95	1.17

(One correct reading was scored as one point. Therefore, the highest possible score for a subject was 10 for each condition.)

Table 2

Grade Differences

	Between 3rd & 5th grade	11.64**		Between 3rd & 5th grade	11.94**
A	Between 3rd & 7th grade	14.41**	C	Between 3rd & 7th grade	21.50**
	Between 5th & 7th grade	5.55**		Between 5th & 7th grade	6.91**
	Between 3rd & 5th grade	1.49		Between 3rd & 5th grade	3.71**
B	Between 3rd & 7th grade	3.31**	D	Between 3rd & 7th grade	7.52**
	Between 5th & 7th grade	2.32*		Between 5th & 7th grade	4.02**
	Between 3rd & 5th grade	13.66**		Between 3rd & 5th grade	13.87**
E	Between 3rd & 7th grade	20.90**	G	Between 3rd & 7th grade	21.00**
	Between 5th & 7th grade	7.16**		Between 5th & 7th grade	7.88**
	Between 3rd & 5th grade	1.72		Between 3rd & 5th grade	3.38**
F	Between 3rd & 7th grade	2.65**	H	Between 3rd & 7th grade	5.93**
	Between 5th & 7th grade	1.12		Between 5th & 7th grade	2.87**

** $P < .01$ * $P < .05$

Results

1. The complexity of characters had no effect on the reading of Kanji.

2. The frequency of Kanji was one of the significant factors which affected reading.

3. The familiarity of words in which Kanji characters were used was the most predominant factor in reading.

Bibliography

Fukuzawa, Shusuke. "Psychological Study of the Learning of Japanese." Proceedings of the 27th Annual Convention of the Japanese Psychological Association, p. 318, 1963.

A Yardstick for Readability

Ichiro Sakamoto

Problem

Japanese researchers have no devices for measuring the readability of Japanese sentences.

Purpose

To develop an objective method to assess the readability of Japanese sentences.

Hypotheses

(1) Sentences in textbooks are arranged in terms of readability, grade by grade.

(2) Factors in readability are Kanji characters, vocabulary, sentence length (long sentences and short sentences), and conversation. (Kanji characters represent larger, conceptual ideas as differentiated from Hiragana characters representing sounds of syllables.)

Method

(1) Thirty literature-type stories and 30 expository chapters were selected from the textbooks for every grade from the first through the 12th grades. All of the 30 literature-type stories were selected from Japanese textbooks, while the expository chapters were taken from social studies and science textbooks. All the stories were programmed to be taught around the middle of the second semester.

(2) The rate of Kanji characters to the total number of total characters was calculated for each grade.

(3) The rate of basic words to the total number of words was calculated for each grade. The basic word was defined as a word which was listed in the level A (the most basic 5,000 words) in the Sakamoto Basic Word

Science of Reading, Vol. 14, Nos. 1-2, 1-6, 1971

Lists.

(4) The rate of long sentences and the rate of short sentences to the total numbers of sentences was calculated for each grade. The long sentence was defined as a sentence of 10 or more words. The short sentence was defined as one with five or less words.

(5) The rate of conversational sentences to the total number of sentences was calculated for each grade. The conversational sentence was defined as a direct quotation of a spoken sentence. (In the case of the literature-type text only.)

Results

Table 1

The Number of Kanji Characters

	Grade	Rate(%)	S.D.		%	S.D.	
Elementary	1	3.73	2.91				
				**			
	2	6.75	4.37				
				**			
	3	10.89	5.72				
				**			
	4	15.08	5.84				
				**			**
	5	19.42	6.43	)			
				++)	20.35	6.64	
	6	21.28	6.84	)			
				**			**
Junior High	1	24.74	6.81	)			
				++)			
	2	26.93	6.38	)	25.50	6.28	
				++)			
	3	27.83	5.66	)			
				++			**
Senior High	1	29.70	6.73	)			
				++)			
	2	31.06	7.63	)	30.89	7.79	
				++)			
	3	31.92	9.00	)			

** significant difference at 1% level

++ no significant difference

Table 2

The Number of Basic Words

	Grade	Rate(%)	S.D.		%	S.D.	
Elementary	1	98.93	4.59				
				*			
	2	96.89	5.04				
				**			
	3	93.62	5.86				
				**			
	4	87.64	9.33				
				**			
	5	83.04	9.95				
				**			**
	6	77.17	13.58	)			
				++)	76.36	14.08	
Junior High	1	75.55	14.57	)			
				++			*
	2	71.55	16.26	)			
				++)	70.09	16.04	
	3	68.62	15.82	)			
				*			*
Senior High	1	62.31	16.95				
				*			
	2	56.37	18.67				
				*			
	3	47.19	17.19				

* significant difference at 5% level

** significant difference at 1% level

++ no significant difference

Table 3

The Number of Long Sentences

	Grade	Rate(%)	S.D.		%	S.D.	
Elementary	1	2.9	11.59				
				**			
	2	13.5	16.11				
				**			
	3	23.0	17.56				
				**			
	4	32.0	18.59				
				*			**
	5	39.6	16.72	)			
				++)	42.1	16.52	
	6	44.6	16.61	)			
				++			**
Junior High	1	50.3	16.42	)			
				++)	52.2	16.71	
	2	54.1	17.00	)			
				++			*
	3	57.1	15.09	)			
				++)	58.7	16.12	
Senior High	1	60.2	17.15	)			
				++			*
	2	63.3	17.09	)			
				++)	65.6	17.25	
	3	67.8	17.41	)			

* significant difference at 5% level

** significant difference at 1% level

++ no significant difference

Table 4

The Number of Short Sentences

	Grade	Rate(%)	S.D.		%	S.D.	
Elementary	1	73.0	27.75				
				**			
	2	42.7	27.19				
				**			
	3	27.2	16.42				
				++			*
	4	23.4	14.89	)			
				++)			
	5	21.3	14.94	)	21.5	14.52	
				++)			
	6	19.9	14.72	)			
				++			**
Junior High	1	17.3	13.00	)			
				++)			
	2	15.2	14.01	)	14.8	13.05	
				++)			
	3	12.0	12.13	)			
				++			++
Senior High	1	11.6	10.78	)			
				++)			
	2	10.4	7.78	)	10.8	9.18	
				++)			
	3	10.4	8.98	)			

* significant difference at 5% level

** significant difference at 1% level

++ no significant difference

Table 5

The Amount of Conversation

	Grade	Rate(%)	S.D.		%	S.D.	
Elementary	1	34.5	12.60	) ++)			
	2	33.2	15.67	) ++)	32.5	15.13	
	3	29.9	17.14	) ++			**
	4	24.8	17.39	) ++)			
	5	19.6	13.95	) ++)	20.1	15.10	
	6	15.9	13.97	) ++			
Junior High	1	13.9	14.96	) ++)			*
	2	12.8	14.68	) ++)			
	3	12.2	10.19	) ++)	12.7	11.51	
Senior High	1	12.0	8.52	) ++)			
	2	12.4	9.26	) ++)			
	3	12.7	11.47	)			

* significant difference at 5% level

** significant difference at 1% level

++ no significant difference

Findings

(1) The number of Kanji characters increased grade by grade (Table 1). There were no significant differences, however, between the fifth and the sixth grades and between any grades in the junior and senior high schools. So, the fifth and the sixth grades were calculated together; junior high levels (7th-9th) were calculated together; and senior high levels (10th-12th) were calculated together. Then all the differences in the number of Kanji characters between two grades (or two groups) next to each other were statistically significant. This finding supported hypothesis one and that part of hypothesis two related to Kanji characters.

(2) The number of basic words decreased from grade to grade (Table 2). The differences in the number of basic words between each two grades were significant except between the sixth and seventh, seventh and eighth, and eighth and ninth. So the sixth through the ninth grades were calculated together. Then all the differences between two grades (or two groups) were statistically significant. This finding supported the hypothesis one and that part of hypothesis two related to vocabulary.

(3) The number of long sentences increased grade by grade (Table 3). The differences were not significant, however, after grade five. When all the grades above grade five were calculated together, the differences were statistically significant. This finding supported hypothesis one and that part of hypothesis two related to sentence length.

(4) The number of short sentences decreased grade by grade (Table 4). But the differences were significant only in the case of the first and the second as well as the second and the third grades. This finding supported hypothesis one in part but did not really support that part of hypothesis two which related to sentence length (short sentences).

(5) The amount of conversation in the literature-type texts decreased grade by grade. There were no significant differences. This supported hypothesis one, but did not support hypothesis two in relation to amount of conversation.

Conclusion

The number of Kanji characters, the number of basic words, and the number of long sentences supported both hypothesis one and the related parts of hypothesis two. Readability of Japanese sentences can be measured by those three factors. According to the means and SDs, the following tables of the assessment of readability were made.

Table 6

The Assessment of Readability by the Rate (%) of Kanji

	Grades	Very Easy	Easy	Suitable	Difficult	Very Difficult
Elementary	1		0.1 -- 2.3	-- 5.2	-- 8.1	-- 11.0
	2		0.1 -- 4.6	-- 8.9	-- 13.3	-- 17.7
	3	0.1 --	2.3 -- 8.0	-- 13.8	--- 19.5	-- 25.2
	4	0.5 --	6.3 -- 12.2	-- 18.0	-- 23.8	-- 29.7
	5,6	3.7 --	10.4 -- 17.0	-- 23.7	-- 30.3	-- 37.0
Junior High	1,2,3	10.8 --	17.1 -- 23.4	-- 29.6	-- 35.9	-- 42.2
Senior High	1,2,3	11.4 --	19.2 -- 27.0	-- 34.8	-- 42.6	-- 50.4

Table 7

The Assessment of Readability by the Rate of Basic Words

	Grades	Very Easy	Easy	Suitable	Difficult	Very Difficult
Elementary	1		100.0	96.6	92.0	87.5
	2	100.0	99.4	94.4	89.3	84.3
	3	100.0	96.6	90.7	84.8	79.0
	4	100.0	92.3	83.0	73.6	64.3
	5	100.0 -- 98.0	-- 88.1	-- 78.1	-- 68.1	-- 58.2
	6 &					
Junior High	1	100.0 -- 97.5	-- 83.4	-- 69.3	-- 55.2	-- 41.2
Junior High	2,3	100.0 -- 94.2	-- 78.1	-- 62.1	-- 46.1	-- 30.0
Senior High	1	100.0 -- 87.7	-- 70.8	-- 53.8	-- 36.9	-- 19.9
	2	100.0 -- 83.4	-- 64.7	-- 46.1	-- 27.4	-- 8.7
	3	90.2 -- 73.0	-- 55.8	-- 38.6	-- 21.4	-- 4.2

Table 8

The Assessment of Readability by the Rate of Long Sentences

	Grades	Very Easy	Easy	Suitable	Difficult	Very Difficult
Elementary	1		0.1	-- 8.7	-- 20.3	-- 31.9
	2	0.1	-- 5.4	-- 21.6	-- 37.7	-- 53.8
	3	0.1	-- 14.2	-- 31.8	-- 49.3	-- 66.9
	4	0.1 -- 4.1	-- 22.7	-- 41.3	-- 59.9	-- 78.5
	5,6	0.8 -- 17.3	-- 33.8	-- 50.4	-- 66.9	-- 83.4
Junior High	1,2	10.4 -- 27.1	-- 43.8	-- 60.6	-- 77.3	-- 94.0
Junior High	3 &					
Senior High	1	18.4 -- 34.5	-- 50.6	-- 66.8	-- 82.9	-- 99.0
Senior High	2,3	22.5 -- 39.7	-- 57.0	-- 74.2	-- 91.5	-- 100.0

BIBLIOGRAPHY

Ueno, Hideo. "A Study on the Comprehensibility of the Sentence," Science of Reading, Vol. 5, No. 2, pp. 8-18, 1960.

Sakamoto, Ichiro. "Assessment of the Vocabulary Weight of Sentences," Science of Reading, Vol. 6, Nos. 1-2, pp. 37-44, 1962.

Sakamoto, Ichiro. "Length of Sentences in Textbooks," Science of Reading, Vol. 7 No. 2, pp. 17-24, 1963.

Sakamoto, Ichiro. "Assessment of the Weight of Sentence Length," Science of Reading, Vol. 8, No. 1, pp. 2-6, 1964.

Sakamoto, Ichiro. "Sentence length in Modern Journalism," Science of Reading, Vol. 8, No. 2, pp. 7-10, 1965.

Sakamoto, Ichiro. "Sentence Length of Modern Novels," Science of Reading, Vol. 9, No. 1, pp. 30-37, 1965.

A Developmental Study of Reading Rate

Ichiro Sakamoto

Problems

In the past in Japan when the development of reading rate was investigated, it was the usual practice to provide the children of different grades with the same reading material. The material had to be easily read by the lowest grade children, that is, the material had to be written in Hiragana only. Material composed of all Hiragana sentences, however, was difficult for upper grade children who had learned some Kanji characters.

Purposes

When the children of each grade are given suitable reading material in terms of the amount of basic words, the amount of Kanji, and the amount of long sentences according to the standard which the investigator published in a previous paper (Science of Reading, Vol. 14, Nos. 1-2, pp. 1-6, 1971), what will happen to the speed of reading of subjects in each grade? The purpose of this study is to learn: 1) whether or not the speed of reading of each grade is the same when each subject reads a text suitable to his or her own grade; 2) how fast children read; and 3) how accurately they read.

Method

1) Eight narrative stories were used as reading materials, one for each grade from the second to the ninth. Each story consisted of 500 words. Some words or sentences were revised so that each story fit the grade standard. Readability of each text is shown in Table 1.

Science of Reading, Vol. 15, No. 2, Pp. 39-43, 1972.
(Japan)

Table 1

Grade	Rate of Basic Words	Rate of Kanji	Rate of Long Sentences	Text	Number of Letters in Total
2	(96.9) 96.9%	(6.8) 6.4%	(13.5) 13.9%	a	(1885)
3	(93.6) 93.6	(10.9)10.7	(23.0) 22.8	b	(1893)
4	(87.6) 87.6	(15.1)15.0	(32.0) 31.9	c	(1892)
5	(83.0) 83.0	(20.4)20.6	(42.1) 41.7	d	(1700)
6	(76.4) 76.4	(20.4)20.8	(42.1) 42.8	e	(1666)
7	(76.4) 76.2	(26.5)25.9	(52.2) 52.5	f	(1775)
8	(70.1) 70.1	(26.5)26.7	(52.2) 52.1	g	(1702)
9	(70.1) 70.6	(26.5)26.5	(52.2) 58.8	h	(1724)

rates in parentheses show grade standard
rates out of parentheses show each text's rate

2) Comprehension tests were constructed for each text consisting of 10 questions which could be answered only when the text was read accurately.

3) The subjects were pupils in grades two through nine, 1,932 in total, enrolled in schools in Tokyo.

4) Subjects were asked to read the text. When they finished reading, they were given the reading time by looking at the blackboard. Each child was asked to write down his or her own reading time on the comprehension test paper, and to answer the questions without reading the text again.

Findings

1) Accuracy of reading

Pupils who responded correctly to eight or more of the ten comprehension questions were regarded as accurate readers. The rate of accurate readers to the

total number of pupils in each school is shown in Table 2.

Table 2

Grade	Schools A	B	C*	D*	Mean
2	87.8	87.5	37.8	73.0	74.9
3	53.5	95.3	67.6	71.8	76.8
4	85.7	71.8	36.1	45.6	61.0
5	79.1	90.6	48.5	64.7	76.1
6	90.5	86.4	51.2	55.2	71.7
Mean	79.6	86.3	48.4	62.6	72.0

*Schools C & D have easier entrance requirements than others

Grade	Schools A	B	C*	Mean
7	89.7	83.5	53.9	75.6
8	87.6	77.1	62.3	76.4
9	96.6	92.3	73.8	87.8
Mean	91.3	84.3	63.2	80.0

*School C has easier entrance requirements.

2) The speed of reading was computed for the accurate readers only. (Table 3)

Table 3

Grade	Mean* SD Seconds		t-test	Reading Speed Per Minute Words	Letters
2	345	112	++	87.0	327.8
3	341	116	**	88.0	333.1
4	267	99	**	112.4	425.2
5	230	104	++	130.4	443.4
6	216	71	** ++	138.9	462.7
7	202	66	++	148.5	527.8
8	203	63	++	148.8	503.4
9	204	60		147.1	507.1

*This column shows the mean reading time of the whole text (500 words)

++no significant difference

**significant at 1% level

Conclusions

1) Even though subjects were given a suitable story for their own grade, the speed of reading of each grade was not the same. There was a consistent increase in the rates of reading from grades three through five.

2) The table of standards of reading speed for 500 words is based on the means and SDs of each grade.

Table 4

Grade	Fast		Somewhat Fast		Average		Somewhat Slow		Slow	
				Seconds						
2,3	--	172	--	286	--	400	--	514	--	
4	--	119	--	218	--	317	--	416	--	
5	--	74	--	178	--	282	--	386	--	
6	--	110	--	181	--	252	--	323	--	
Jr.High	--	108	--	171	--	234	--	297	--	

3) The accuracy of reading differed between schools.